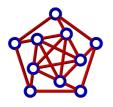
IWOCA 2009



20TH INTERNATIONAL WORKSHOP ON COMBINATORIAL ALGORITHMS JUNE 28 – JULY 2, 2009, HRADEC NAD MORAVICÍ, CZECH REPUBLIC iwoca09@iwoca.org http://www.iwoca.org/iwoca09

Invited lecture

K_t MINORS IN LARGE *t*-CONNECTED GRAPHS

ROBIN THOMAS

A graph G has a K_t minor if a graph isomorphic to K_t , the complete graph on t vertices, can be obtained from a subgraph of G by contracting edges. A long-standing conjecture of Hadwiger states that every graph with no K_t minor is (t-1)-colorable. Hadwiger's conjecture is known for $t \leq 6$, and open for all t > 7.

A deep theorem of Robertson and Seymour describes the structure of graphs with no K_t minor. The theorem is very powerful, but it is fairly complicated to state, and the condition it gives is necessary, but not sufficient, for the exclusion of a K_t minor.

We prove a necessary and sufficient condition under additional restrictions on the graph G. We prove that for every integer t there exists an integer N such that every t-connected graph on at least N vertices with no K_t minor has a set of at most t - 5 vertices whose deletion makes the graph planar. This is best possible in the sense that neither t-connectivity nor the size of the deleted set can be lowered, and for t > 7 some lower bound on the number of vertices is needed.

This is joint work with Sergey Norin.